

Pacific Bell Directory EYP Product Overview

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APPENDIX B

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APPENDIX C

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ISSUES SURROUNDING THE DEVELOPMENT
OF A PACIFIC BELL
BUSINESS-TO-BUSINESS CD-ROM DIRECTORY

5/14/91

- BACKGROUND
- SUPPLIER ISSUES
- CUSTOMER ISSUES
- PRODUCTION

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BACKGROUND

By the end of 1991, about 1 million CD-ROM drives are expected to exist in corporations worldwide: *

- Standalone CD-ROM workstations can help offload high telecommunications costs for online database access.
- Rising costs of paper and maintenance of large manuals and other lengthy documents mandate electronic distribution.
- End-user need for faster, more flexible information retrieval.

CD-ROM technology in business has historically been an extension of traditional online access.

- * Roughly 70 percent of these are in corporate libraries. Also, these penetration numbers vary according to source. This is our most conservative estimate.

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CD-ROM PLAYER COSTS ARE FALLING

There are now over 30 major manufacturers of CD-ROM drives. Prices have fallen drastically over the past three or four years:

- 1988: \$1000 +
- 1989: \$700 + (installed base: 300,000)
- 1990: \$500 + (installed base: 700,000)
- 1991 (Projected): under \$500 (installed base: 1 million)
- 1992 (Projected): under \$300
(projected installed base: 2.1 million)

Thus, almost any business with the need to access large amounts of data can be expected to use CD-ROM.

APPLICATIONS ARE EXPANDING

Two Broad Types:

- Commercial (i.e. for sale to anyone)
- Proprietary (i.e., internal use only)

According to Infotech, 56 CD-ROM titles were available in 1986. By 1990, 2250 titles were available, representing gross revenues of \$1.5 billion.

Proprietary applications are driving CD-ROM penetration because the information is of sufficiently high value to invest in a CD-ROM drive and associated training time.

Commercial applications are sold once the primary use is defined. This may change as a critical mass of high value commercial applications appear in the marketplace.

EXAMPLES OF COMMERCIAL APPLICATIONS

FROM LOTUS:

- Lotus Prompt: A monthly index to demonstrations and upgrades on Lotus products.
- CD/Corporate: A quarterly report of financial information on major corporations.
- CD/Banking: A quarterly report on all federally-insured lending institutions.

FROM MICROSOFT:

- Microsoft Office: A software library and reference guide for small offices.
- Microsoft Bookshelf: A software library for writers.

Prices are highly variable. Lotus charges \$15,000 per year for its "CD/Banking" product. But Microsoft "Bookshelf" is only a few hundred dollars. This represents the difference between "vertical" and "horizontal" product strategies.



IMPROVEMENTS IN TECHNOLOGY WILL CREATE NEW MARKETS

- Multimedia Capabilities: Leading hardware and software suppliers have recently established a standard for adding sound and limited motion to CD-ROMs. Tandy expects to sell 200,000 multimedia machines by early-1992.
- Interactive Television: CDTV (Commodore) and CDI (Philips/Sony) will make available low-cost TV-based interactive multimedia. Sony is also rumored to be creating a low-cost drive for Nintendo.
- Portable Units: Sony has introduced the Data Discman in Japan and recently unveiled a prototype for the U.S. market. The company has also shown a handheld CDI unit.

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SIGNIFICANT ISSUES

1. Which corporate niche markets will grow fastest?
2. What will the ratio of multimedia to non-multimedia machines be at the end of 1992? How will this ratio shift over time? Will this ratio be different in each niche?
3. Which commercial applications will be most successful? When will it make sense to pursue a "horizontal" development strategy (i.e., what constitutes "critical mass")?

SUPPLIER ISSUES

To date, the most successful suppliers of CD-ROM applications in the corporate market have been companies focused on proprietary applications and high-end commercial data.

The reasons are straightforward:

- High equipment and production costs mandate high-value information.
- ✓ • ~~Drucker's Law: Users will not change behavior unless the new method is ten times more valuable!~~
- High price points allow suppliers to bundle readers together with software.

In contrast, lower-cost products like Microsoft "Bookshelf" have consistently lost money. While this will likely change, the volumes simply haven't existed to support horizontal applications.

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Nonetheless, the major supplier issues seem to be reaching resolution:

- Installed Base: Price points are declining to a level where hardware purchase can be easily rationalized.
- Standards: MPC (Multimedia PC) could pave the way for fully integrated multimedia computers in the marketplace.
 - > Fast built-in CD-ROM drive
 - > Digital sound output (CD-ROM XA)
 - > Graphical interface (Windows 3.0)
 - > Extensions to other analog and digital devices (Multimedia Extension 1.0)
- Authoring: A range of authoring environments now exist.

MAJOR SUPPLIER ISSUES

1. Should suppliers simply address the existing, low-level CD-ROM installed base? Or should suppliers jump on the MPC bandwagon and create multimedia titles?
2. Is the MPC a viable new platform or will multimedia evolve through add-on technology?
3. Is the home market viable in the short-term? What about niche applications for portable devices (i.e., a Data Discman directory)?

CUSTOMER ISSUES

To date, customers who have successfully integrated CD-ROM technology have done so by finding a natural fit with existing information retrieval processes (i.e., as a way to lower costs against online access).

The primary question in corporations will therefore be: Does the CD-ROM introduce a usage pattern at odds with existing behavior?


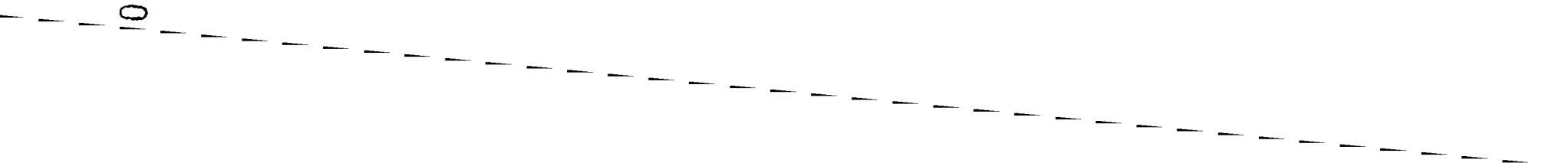
To the extent that it does, we feel the barriers are high.

EXAMPLES OF "NATURAL FIT"

<u>BENEFIT</u>	<u>COMPANY</u>	<u>APPLICATION</u>
Reducing costs of mainframe access.	INTEL	Semiconductor product information.
Extending reach of databases such as parts catalogs or bill of materials listings.	FORD - NEW HOLLAND	Parts lists and pricing information to its dealer network.
Replacement of paper manuals.	DEC	Documentation.



KEY CUSTOMER ISSUES

- 
1. How can Pacific Bell provide an application with "natural fit"?
 2. What "value-added" features can we provide that customers don't already have (i.e. an expert system identifying critical purchasing issues, mapping information, greater depth)?
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PRODUCTION

The CD-ROM production process is much like videodisc production:

- Concept Creation
- Interactive Design
- Data Production and/or Entry
- Authoring
- Testing and Debugging
- Mastering and Replication

Providing easy-to-access information is at the heart of the CD-ROM production planning process.

PRODUCTION COST EXAMPLES

<u>FORMAT</u>	<u>CREATIVE COST</u>	<u>AUTHORING COST</u>	<u>RUN-TIME FEE *</u>
Text Only	Under \$50 K	\$5 - \$25K	0 - \$500
Text & Graphics	\$50 - 350,000 K	\$5 - 25K	0 - \$500
Multimedia	\$100 K - \$1 M	\$15-50 K	0 - \$500

* Can also be conceived as a royalty payment out-of-sales.

CD-ROM REPLICATION COSTS

TURN RATE

MASTERING

DISC PRICE

10 Days

\$1,300

1-200 \$2.05 per disc

2-1000 \$1.80 per disc

Over 1000 \$1.70 per disc

5 Days

\$1,500

Add \$.10 per disc

3 Days

\$1,800

Add \$.20 per disc

(Formatting costs range from \$300-\$700 depending upon input media and retrieval complexing.)

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MAJOR PRODUCTION ISSUES

- Complexity of Graphics
- Authoring Tools
- Data Entry Requirements
- Current Versus Future Platforms

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PRODUCTION OPTIONS

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1. Produce a base-level CD-ROM (text with simple EGA graphics) which will be playable by most CD-ROM owners.

- Could be self-funding.
- Would provide good, real-world experience.

- Is not future-directed.
- Relatively small target mandates a vertical application.
- Crude display characteristics; no sound.

2. Produce a multimedia CD-ROM which will be playable by few customers in 1992, but will likely build over time.

- Would provide valuable experience for future mainstream platforms.
- Would allow low exposure; incremental learning.

- Represents an investment.
- Standards may change.

3. Create a niche application for portable player. Bundle-in low-cost player.

- Could be self-funding.
- Highly targeted.

- High cost would mandate high value application.

4. Produce a series of niche directory floppy discs in EGA. This will have the broadest reach immediately.

- Huge installed base; could provide horizontal application.
- Could probably make money in year one.

- Limited information storage.
- Not future-directed.
- Crude display characteristics; no sound.

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NEXT STEPS

- Identify additional PBD issues.
- Conduct research to resolve significant unknowns.
- Develop product strategy.

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APPENDIX D

1993 TOP 10 REVENUE DIRECTORIES

BANK	DIRECTORY	1990 DHC RATE	1991 DHC RATE	1991/1990 % GROWTH	1992 DHC RATE	1992/1991 % GROWTH	1993 DHC RATE	1993/1992 % GROWTH	1994 DHC RATE	1994/1993 % GROWTH
1	SAN FRANCISCO	\$183.00	\$189.00	3.1%	\$228.00	13.6%	\$261.00	15.5%	\$322.00	23.4%
2	SAN JOSE	\$185.20	\$175.00	12.8%	\$206.00	17.1%	\$220.00	11.7%	\$283.00	23.6%
3	SAN DIEGO	\$146.00	\$181.00	24.0%	\$205.00	13.3%	\$229.00	11.7%	\$283.00	23.6%
4	SACRAMENTO	\$148.00	\$166.00	13.0%	\$181.00	15.8%	\$221.00	15.7%	\$273.00	23.6%
5	OAKLAND	\$175.00	\$175.00	0.0%	\$188.00	13.1%	\$221.00	11.6%	\$273.00	23.5%
6	LOS ANGELES	\$235.00	\$235.00	0.0%	\$275.00	17.0%	\$313.00	13.6%	\$386.00	23.3%
7	FREMONT-HAYWARD	\$183.00	\$130.00	26.2%	\$140.00	13.8%	\$165.00	11.5%	\$203.00	23.0%
8	LA BUSINESS	\$236.00	\$235.00	0.0%	\$275.00	17.0%	\$313.00	13.6%	\$386.00	23.3%
9	CANOGA PARK	\$112.00	\$140.00	25.0%	\$140.00	0.0%	\$185.00	32.1%	\$220.00	18.8%
10	NORTH HOLLYWOOD	\$120.20	\$155.00	28.0%	\$155.00	0.0%	\$189.00	28.4%	\$245.00	22.1%

NOT PUBLISHED IN 1990. USED 1979 RATE FOR 1990.

BANK	DIRECTORY	1985 DHC RATE	1985/1984 % GROWTH	1986 DHC RATE	1986/1985 % GROWTH	1987 DHC RATE	1987/1986 % GROWTH	1988 DHC RATE	1988/1987 % GROWTH
1	SAN FRANCISCO	\$365.00	13.4%	\$380.00	4.1%	\$405.00	6.6%	\$435.00	7.4%
2	SAN JOSE	\$325.00	14.8%	\$325.00	0.0%	\$325.00	0.0%	\$326.00	0.3%
3	SAN DIEGO	\$309.00	9.2%	\$331.00	7.1%	\$331.00	0.0%	\$350.00	5.7%
4	SACRAMENTO	\$314.00	16.0%	\$314.00	0.0%	\$330.00	5.1%	\$357.00	8.2%
5	OAKLAND	\$311.00	13.9%	\$311.00	0.0%	\$330.00	6.1%	\$351.00	6.4%
6	LOS ANGELES	\$430.00	11.4%	\$430.00	0.0%	\$430.00	0.0%	\$460.00	7.0%
7	FREMONT-HAYWARD	\$231.00	13.8%	\$231.00	0.0%	\$241.00	4.3%	\$241.00	0.0%
8	LA BUSINESS	\$430.00	11.4%	\$447.00	4.0%	\$447.00	0.0%	\$482.00	10.1%
9	CANOGA PARK	\$220.00	0.0%	\$220.00	0.0%	\$220.00	0.0%	\$230.00	4.5%
10	NORTH HOLLYWOOD	\$245.00	0.0%	\$245.00	0.0%	\$251.00	2.4%	\$285.00	6.6%

BANK	DIRECTORY	1989 DHC RATE	1989/1988 % GROWTH	1990 DHC RATE	1990/1989 % GROWTH	1991 DHC RATE	1991/1990 % GROWTH	1992 DHC RATE	1992/1991 % GROWTH	1993 DHC RATE	1993/1992 % GROWTH
1	SAN FRANCISCO	\$463.00	8.4%	\$488.00	5.8%	\$509.00	4.1%	\$532.00	4.5%	\$555.00	4.3%
2	SAN JOSE	\$352.00	8.0%	\$378.00	7.4%	\$388.00	5.6%	\$417.00	4.5%	\$438.00	5.0%
3	SAN DIEGO	\$374.00	8.8%	\$406.00	8.8%	\$426.00	4.8%	\$445.00	4.5%	\$471.00	6.0%
4	SACRAMENTO	\$403.00	12.9%	\$441.00	9.4%	\$487.00	5.8%	\$488.00	4.5%	\$509.00	4.3%
5	OAKLAND	\$383.00	9.1%	\$404.00	5.5%	\$422.00	4.5%	\$442.00	4.7%	\$460.00	4.1%
6	LOS ANGELES	\$482.00	7.0%	\$528.00	8.9%	\$548.00	4.2%	\$548.00	0.0%	\$548.00	0.0%
7	FREMONT-HAYWARD	\$263.00	9.1%	\$286.00	8.7%	\$301.00	5.2%	\$316.00	5.0%	\$330.00	4.4%
8	LA BUSINESS	\$538.00	8.8%	\$578.00	7.4%	\$604.00	4.3%	\$622.00	3.0%	\$634.00	1.8%
9	CANOGA PARK	\$260.00	8.7%	\$286.00	6.4%	\$277.00	4.1%	\$289.00	4.3%	\$285.00	2.1%
10	NORTH HOLLYWOOD	\$280.00	5.7%	\$288.00	5.7%	\$308.00	4.1%	\$320.00	3.9%	\$328.00	1.8%

DHC Double Half Column (Two columns in width & one-half column in length)